

บทความที่น่าสนใจประจำเดือนสิงหาคม 2557

สาขาวิทยาศาสตร์และเทคโนโลยี

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| Title: | Randomized game semantics for semi-fuzzy quantifiers |
| Author: | Christian G. Fermüller and Christoph Roschger |
| Journal: | Logic Journal of the IGPL, Volume 22, Issue 3, June 2014, Pp. 413-439 |
| Abstract: | We take up the challenge to extract particular truth functions for fuzzy quantifiers from a game semantic framework. To this aim, we start with a fresh look at Hintikka's evaluation game for classical first-order logic and show that randomizing payoffs in that classical game results in a characterization of so-called weak Łukasiewicz logic. A further step of generalization, considering more than one formula as available for attack at a given state of the game, leads to Giles's game for full Łukasiewicz logic. Finally, we extend this framework to random choices of witnesses for quantified statements. This allows us to characterize two families of extensions of Łukasiewicz logic with different semi-fuzzy proportionality quantifiers that include candidate models for vague natural language quantifiers like <i>about half</i> . |
| Database: | Oxford Journals Online |
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| Title: | Modal twist-structures over residuated lattices |
| Author: | Hiroakira Ono and Umberto Rivieccio |
| Journal: | Logic Journal of the IGPL, Volume 22, Issue 3, June 2014, Pp. 440-457 |
| Abstract: | We introduce a class of algebras, called twist-structures, whose members are built as special squares of an arbitrary residuated lattice. We show how our construction relates to and encompasses results obtained by several authors on the algebraic semantics of non-classical logics. We define a logic that corresponds to our twist-structures and show how to expand it with modal operators, obtaining a paraconsistent many-valued modal logic that generalizes existing work on modal expansions of both Belnap–Dunn logic and paraconsistent Nelson logic. |
| Database: | Oxford Journals Online |
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| Title: | An expansion of first-order Belnap–Dunn logic |
| Author: | Katsuhiko Sano and Hitoshi Omori |
| Journal: | Logic Journal of the IGPL, Volume 22, Issue 3, June 2014, Pp. 458-481 |
| Abstract: | This article proposes to expand first-order Belnap–Dunn logic with a new operator, whose intuitive meaning is '- is designated' or '- has designated values'. It amounts to considering all of D'Ottaviano's possibility connective of J3, Baaz's Delta operator of infinite-valued Gödel logic and Kachi's |

	determinate operator, in the different context of Belnap–Dunn logic. As for proof theory, we employ a natural deduction calculus with a slot for weakly definable connectives. Our main theorem is a general completeness result with respect to $P(\{0,1\})$ -valued semantics, which enables us to derive new completeness results for first-order extensions of Kachi's SPL and Omori and Waragai's BS4 and the known completeness results of D'Ottaviano and da Costa's J3 and Carnielli, Marcos and de Amo's LF11.
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Title:	A Fuzzy Similarity Measure of Intuitionistic Fuzzy Sets for Color Image Retrieval Systems
Author:	AFSARI, FATEMEH; ESLAMI, ESFANDIAR; PENG-YUNG WOO
Journal:	Journal of Multiple-Valued Logic & Soft Computing. 2014, Vol. 22 Issue 1/2, p1-20. 20p.
Abstract:	In this paper a new scheme for image retrieval is proposed that represents color images by using the concepts of intuitionistic fuzzy sets while the concept of similarity is also characterized by fuzzy concepts. Color features that could be expressed in various color representation systems have been intensively used, independently or jointly, in image processing during the past decades. Fuzziness arises naturally from the imprecision or vagueness of the pixel color values and human perception. The Hue and Value in the HSV color space are used to construct the 2-D intuitionistic fuzzy sets. In the intuitionistic fuzzy sets, not only the membership degrees are considered but also the uncertainties that are involved in the non-membership degrees and are known as the hesitation measures are considered. The proposed similarity measure of intuitionistic fuzzy sets is a fuzzy quantity, rather than crisp quantity due to the vague concept of the similarities. Large-scale experiments demonstrate the robustness and effectiveness of the proposed scheme.
Database:	Computers & Applied Sciences Complete

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Title:	Clock Distribution Area Reduction Using a Multiple-Valued Clocking Approach
Author:	MENON, ROHIT P.; THORNTON, MITCHELL A.
Journal:	Journal of Multiple-Valued Logic & Soft Computing. 2014, Vol. 22 Issue 1/2, p21-39. 19p.
Abstract:	Multi-phase clocking methods are well known and widely used in high-performance integrated circuit design. Such a scheme allows for relaxation of timing constraints among disjoint partitions of the logic circuitry since lower frequency local clocking is required as compared to the system clock frequency at the cost of increased clock distribution network area. The disadvantage is that multiple clock distribution trees are required, one for each clock domain or phase within the integrated circuit. Clock distribution networks have the highest fanout of any circuit within typical ICs and represent a significant amount of resource utilization. We devise a method that retains the advantages of multi-phase IC design, but utilizes a single global multiple-valued clock signal distribution network versus separate

	distribution networks for each phase in an ASIC or custom VLSI implementation. The technique requires a minimal amount of modification to existing multiphase designs and is evaluated and compared to traditional multiphase designs. Furthermore, the approach is applicable to programmable logic (FPGA) implementations through distributing the multiple-valued clock signal using $\log_2(N)$ distribution networks for an N-phase system. Experimental results are provided to validate and evaluate the approach.
Database:	Computers & Applied Sciences Complete

6	Title:	A Fuzzy Risk Assessment Model for Warehouse Operations
	Author:	USTUNDAG, ALP
	Journal:	Journal of Multiple-Valued Logic & Soft Computing. 2014, Vol. 22 Issue 1/2, p133-149. 17p.
	Abstract:	With the increasingly competitive nature of industry today it is very critical for organizations that supply chains continue to work as planned, with smooth and uninterrupted flows of materials from initial suppliers through to final customers. For an efficient supply chain management, risks should be identified, analyzed and managed accurately throughout the whole supply chain. Particularly, warehouse processes in supply chain operations contain risks to consider which lead to a poor supply chain performance. Therefore, risk assessment has been an important task for warehouse management. Failure mode and effect analysis (FMEA) is a suitable method for identifying all failure modes within a system, assessing their impact, and planning for corrective action. The traditional FMEA determines the risk priorities of failure modes, which require the risk factors like the occurrence (O), severity (S) and detection (D) of each failure mode to be evaluated. However, it has some drawbacks so that affect the risk evaluation and correction action. It is very difficult for three risk factors to be evaluated precisely. Additionally, traditional FMEA doesn't consider the relative importance of three risk factors. In this paper, a risk assessment model using fuzzy FMEA method is proposed to evaluate the risks of warehouse operations. The rating of three factors is expressed as triangular fuzzy number and the relative importance among O, S and D is also considered as triangular number with respect to the judgments of experts. For defuzzification, α -cut and satisfactory index β are used in the model. The proposed model is applied to determine the most critical failure modes for warehouse operations of a food retail distributor in Turkey.
	Database:	Computers & Applied Sciences Complete

7	Title:	Parity Games and Propositional Proofs
	Author:	Arnold Beckmann, Pavel Pudlák, Neil Thapen
	Journal:	ACM Transactions on Computational Logic, Volume 15 Issue 2, April 2014, Article No. 17

Abstract:	A propositional proof system is weakly automatizable if there is a polynomial time algorithm that separates satisfiable formulas from formulas that have a short refutation in the system, with respect to a given length bound. We show that if the resolution proof system is weakly automatizable, then parity games can be decided in polynomial time. We give simple proofs that the same holds for depth-1 propositional calculus (where resolution has depth 0) with respect to mean payoff and simple stochastic games. We define a new type of combinatorial game and prove that resolution is weakly automatizable if and only if one can separate, by a set decidable in polynomial time, the games in which the first player has a positional winning strategy from the games in which the second player has a positional winning strategy. Our main technique is to show that a suitable weak bounded arithmetic theory proves that both players in a game cannot simultaneously have a winning strategy, and then to translate this proof into propositional form.
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8	Title: Preferred First-Order Answer Set Programs
	Author: Vernon Asuncion, Yan Zhang, Yi Zhou
	Journal: ACM Transactions on Computational Logic, Volume 15 Issue 2, April 2014, Article No. 11
	Abstract: In this article, we consider the issue of how first-order answer set programs can be extended for handling preference reasoning. To this end, we propose a progression-based preference semantics for first-order answer set programs while explicit preference relations are presented. We study essential properties of the proposed preferred answer set semantics. To understand the expressiveness of preferred first-order answer set programming, we further specify a second-order logic representation which precisely characterizes the progression-based preference semantics.
	Database: ACM Digital Library

9	Title: Linearity: A Roadmap
	Author: Sandra Alves, Maribel Fernández, Mário Florido, and Ian Mackie
	Journal: Journal of Logic and Computation, Volume 24 Issue 3 June 2014, Pp. 513-529
	Abstract: In this article we discuss three different notions of linearity: syntactical, operational and denotational. We briefly define each notion of linearity, pointing out some of the main results in the area, and describe applications of linear languages and type systems.
	Database: Oxford Journals Online

10	Title: The enriched effect calculus: syntax and semantics
	Author: Jeff Egger, Rasmus Ejlers Møgelberg, and Alex Simpson
	Journal: Journal of Logic and Computation, Volume 24 Issue 3 June 2014, Pp. 615-654

Abstract:	<p>This article introduces the enriched effect calculus, which extends established type theories for computational effects with primitives from linear logic. The new calculus provides a formalism for expressing linear aspects of computational effects; e.g. the linear usage of imperative features such as state and/or continuations.</p> <p>The enriched effect calculus is implemented as an extension of a basic effect calculus without linear primitives, which is closely related to Moggi's computational metalanguage, Filinski's effect PCF and Levy's call-by-push-value. We present syntactic results showing: the fidelity of the behaviour of the linear connectives of the enriched effect calculus; the conservativity of the enriched effect calculus over its non-linear core (the effect calculus); and the non-conservativity of intuitionistic linear logic when considered as an extension of the enriched effect calculus.</p> <p>The second half of the article investigates models for the enriched effect calculus, based on enriched category theory. We give several examples of such models, relating them to models of standard effect calculi (such as those based on monads), and to models of intuitionistic linear logic. We also prove soundness and completeness.</p>
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